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ECONOMIC AND INDUSTRIAL AFFAIRS

No. 2299

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**EAST EUROPE REPORT
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BULGARIA

BULGARIAN FOREIGN TRADE MINISTER INTERVIEWED

Moscow IZVESTIYA in Russian 21 May 82 p 5

[Interview with Khristo Khristov, Bulgarian minister of foreign trade, by IZVESTIYA correspondent V. Lukashin: "To Strengthen Cooperation"]

[Text] [Question] Of what importance is foreign trade for the further development of the Bulgarian economy?

[Answer] The role of foreign trade in the socioeconomic development of Bulgaria is determined primarily by the tasks of socialist construction. Of course it is also essential to consider the particular features of our national economy with its certain limited natural resources and domestic market.

Foreign trade ties have always been of greater importance for successfully carrying out the tasks which had to be resolved by our nation over the more than three and a half decades of socialist development. This was the case during the period of establishing the present-day industrial-agrarian structure of the economy. This was the case during the years when accelerated development of heavy industry, electronic and machine building was essential. Finally, it is essential now when, in accord with the decisions of the 12th BCP [Bulgarian Communist Party] Congress a transition is being made to production intensification and the comprehensive improvement of the nation's economic life.

In giving the report of the BCP Central Committee to the 12th Party Congress, Comrade Todor Zhivkov said: "Our participation in the international division of labor is viewed by us as an exceptionally important and powerful factor in the all-round intensification of the national economy. For this reason in the Eighth Five-Year Plan the growth of foreign trade turnover should significantly outstrip the growth of national income."

Thus, foreign trade has now become a powerful and very active factor in improving the structure of the various national economic sectors and the economy as a whole, for raising social labor productivity and for the rapid introduction and effective realization of the achievements of scientific and technical progress.

[Question] Please tell us about the economic ties of Bulgaria with the USSR and the other socialist countries.

[Answer] The economic ties between Bulgaria and the USSR are carried out, as is known, on the basis of long-term intergovernmental agreements which define the volume and range of the reciprocally delivered goods for a 5-year period. These agreements are of very important significance for the intensive development of all the national economic sectors and they guarantee the planned and rhythmical supply of Bulgaria with the necessary machines, raw products and other goods. At the same time, they ensure the stable sales of our industrial and agricultural products.

It is essential to accentuate the growth rates of trade between our nations. Over the last 10 years, the average annual increase in the foreign trade volume was 12-14 percent. In 1976-1980, the volume of two-way deliveries reached 29 billion rubles. Is this much or little? For comparison's sake I would say that this exceeds the volume of trade over the period of the three previous five-year plans taken together.

I would like to recall that the USSR has always held and presently holds first place in Bulgarian foreign trade turnover. The USSR is responsible for over 50 percent of our nation's total foreign trade. In turn, Bulgaria holds third or fourth place in Soviet foreign trade. During the period from 1981 through 1985, trade between our nations will significantly increase. The value of the two-way deliveries will exceed 40 billion rubles.

Our trade ties have assumed particular scope after the adoption of the General Plan for Specialization and Cooperation in the Area of Material Production between Bulgaria and the USSR up to 1990. New horizons have been opened up for the further development of specialization and cooperation in the area of machine building, electronics, electrical engineering, chemistry and petrochemistry. Here are just a few facts. Between our nations there are over 30 agreements in effect on specialization and cooperation for the period from 1981 through 1985 and about 40 sectorial programs for specialization and cooperation have been signed up to the year 1990. At the same time, our trade is constantly broadening with the other fraternal nations. The proportional amount of this trade exceeds 20 percent of all Bulgarian foreign trade.

[Question] How are Bulgaria's relations developing with the developing and capitalist nations?

[Answer] Socialist Bulgaria maintains extensive and diverse trade ties and economic cooperation with scores of states in the Near East and Africa, Asia and Latin America. In recent years, there has been dynamic growth in trade and the volume of cooperation has increased in the area of designing, building and operating production and other projects in these nations. The chief results are primarily the results of the comprehensive approach which we employ. The core of such an approach lies in the long-term and mutually advantageous development of trade and economic ties which help to increase the national economic potential of the developing countries.

About the capitalist nations. Bulgarian policy in the area of economic relations with the industrially developed states of the West is also consistent and clear. We have always supported and do support equal and mutually advantageous trade and economic relations with our partners in accord with the spirit of the Helsinki Final Act, in the interests of both economic and broader political cooperation and mutual

CZECHOSLOVAKIA

APRIL 1982 ECONOMIC RESULTS SUMMARIZED

Prague HOSPODARSKE NOVINY in Czech 21 May 82 p 2

[Report by Dr Eng Vaclav Cap, CSc, Federal Office of Statistics: "April 1982"]

[Text] A characteristic feature of development of the national economy in this year's plan--and the reality conforms to it--is the slowdown of dynamism in production of resources and in outputs in those sectors and branches in which we must adjust the production basis to smaller material and energy resources. The preliminary results achieved by industrial production in April essentially meet this requirement, but the production decline in the construction sector was smaller than planned. The enterprises must make much more effective use of this planned slowdown in dynamism for solution of problems related to production efficiency. This possibility has not been sufficiently utilized so far. The high use value of products manufactured at minimum cost therefore is the key uncompromising criterion. The prices achieved on foreign markets, satisfaction of consumers on the domestic market and effective capital investments which are the objective yardstick for it have been improving only slowly.

In comparison with the same period last year, industrial production increased 1.4 percent in April and 0.9 percent from the beginning of the year. The growth rate set by the annual plan was thus surpassed 0.6 percent. The production trend in individual sectors, however, indicates that everything is not in order everywhere. Although the enterprises generally met plan targets, more than 25 percent of them failed to do so. By far the most unfavorable is the comprehensive compliance with the mandatory indicators which were not complied with by 2/3 of enterprises during the first quarter. While industrial production increased in April as indicated above, production of electric energy increased 3 percent which essentially represented the increase in energy consumption. This increased consumption was caused among other things also by surpassing the production plan target in the ferrous metallurgy sector, where the 2.2 percent increase in April was substantially higher than anticipated by the plan. Extraordinary attention must be paid also in the future to the woodworking industry, where the new production capacities have not reached the planned parameters and are put into operation with delay.

Light industry developed both in April and from the beginning of the year in accordance with the plan: production increased 1.7 percent in comparison with the first 4 months of 1981. Chemical production and crude oil processing declined in accordance with the planned possibilities of crude oil supply. Engineering production increased more significantly in April--5.3 percent in comparison with April 1981. The sales and prices of products in the future months will evidence to what extent this increase is substantiated by effective, desirable production.

Sales of industrial products improved in April: with the exception of exports to the nonsocialist states, the enterprise tasks were fulfilled in all directions from the beginning of the year. As last year, the gradual improvement of trade and payments balances with foreign countries is among the foremost tasks of production enterprises and foreign trade organizations.

Although in construction the backlog in the plan fulfillment accumulated during the first quarter was reduced in April, the 7.2 percent reduction in the volume of construction work during the first 4 months--as compared with the same period of 1981--was bigger than anticipated by the plan. This indicates that a number of construction organizations have not yet reacted to the changed situation in capital investment and to the necessary restructuring of their construction capacities. The reduced scope of new projects urged already for several years failed to augment capacities designed for completion of construction projects. Yet, it must be and has been evident already for a long time that only those construction projects will be carried out which are in harmony with the proportions in the use of the national income, and are indispensable for smooth functioning of the economy.

In agriculture, dry and simultaneously cold weather in April delayed the plant growth. In the purchase of animal products, the purchase of slaughter animals and poultry is proceeding on schedule, while the purchase of milk and eggs is lagging behind. In comparison with the same period last year, the purchase of meat declined 35,000 tons, milk by 27 million liters and eggs by 11 million from the beginning of the year. To maintain the optimum relation between the fodder supply, the number of domestic animals and animal production remain the foremost task of agricultural production plants.

Despite partial successes in increasing efficiency, production intensification, structural changes and quality products with high technical parameters and use properties do not correspond to the needs or possibilities of the economy.

The adjusted net outputs in the economic organizations were higher in the first quarter than specified by the plan--primarily because of lower material consumption. The share of material cost in outputs was 64.87 percent and was 0.1 points lower than the annual plan specifies. From the small increase in the share of wage costs it is possible to conclude that more human labor is being put into production and that the production structure is changing in favor of products requiring more human labor. At the same time, the small sphere of labor productivity increase in the gross production increase indicates, however, that not all enterprises have as yet effective management,

good work organization or are applying the latest scientific and technical achievements on a timely basis.

According to the preliminary results of the first 4 months, capital investment and deliveries, excluding "Z" project and investments by the population, amounted to Kcs 31.2 billion which was 5.9 percent less than during the same period last year. The diminishing scope of investments conforms to the state plan. The intentions of investment policy to complete construction projects more rapidly are not being carried out. For example: of 10 capacities specified as mandatory tasks of the state plan only three were put into operation in the first quarter, while the deadlines for the remaining 7 were extended to the second half of the year.

In foreign trade, sale of finished products at good prices requires offering goods of superior quality, outstanding technical standards with faultless and reliable services. For consumer goods fashionable design is required. The uneven and irregular fulfillment of our export plan shows that we are still far from meeting these requirements. This is particularly noticeable in our relations with the nonsocialist countries, where due to the intensifying economic recession, competition is becoming increasingly fierce. Exports to these countries during the first 4 months of this year fell insignificantly below the last year's level, but the state plan had anticipated a relatively rapid increase this year. For this reason, strict criteria apply and are enforced to the overall economic relations with the nonsocialist states at the present time. Imports from these countries during the first 4 months were more than 20 percent below the last year's level. Exports to the socialist countries increased 12.4 percent and imports by 8.8 percent over the January-April period last year. The relation in the development of export and import prices was unfavorable for us last year, and preliminary calculations indicate that this tendency is continuing this year.

While the retail trade turnover in the main trade systems increased 2.4 percent in April and 3.3 percent during the first 4 months in comparison with the same periods last year, and the retail prices increased more than during the comparable period 1981. The demand by the population on the domestic market as measured by the physical volume of sold goods declined slightly. The population's monetary incomes increased 3.1 percent in April over the April 1981 level, and 2.5 percent during the January-April period over the comparable period of 1981. Savings accounts deposits amounted to Kcs 171.3 billion at the end of April and were Kcs 9.8 billion higher than a year ago. The money supply increased Kcs 2.1 billion and amounted to Kcs 46.5 billion.

Basic Indicators of National Economy's Development in April 1982
 Increases Over Comparable 1981 Period (in percent)

	<u>April</u>	<u>Jan-Apr</u>	<u>State plan¹</u>
Deliveries of the Centrally Administered Industry for:			
--investments at wholesale prices	-	7.7	-11.9
--domestic market			
at wholesale prices	-	-0.5	-0.3 ²
at retail prices	-	-1.6	1.6 ²
--export to socialist countries	-	7.7	2.6 ²
at wholesale prices	-	9.4	4.7 ²
at FOB prices	-	4.9	4.6 ²
--export to nonsocialist countries	-	-2.0	6.7 ²
at wholesale prices	-	0.8	0.3 ²
at FOB prices	-	0.7	0.3 ²
--other sales for industrial production			
and operations at wholesale prices	-	0.5	-
volume of industrial production	1.4	0.9	0.6 ²
average number of employees	0.8	0.7	0.3 ²
labor productivity based on industrial production	0.7	0.2	0.3 ²
Construction			
construction work performed with internal labor resources	-3.6	-7.2	-4.2
average number of employees	-0.6	-0.7	-.08
labor productivity based on construction work	-3.0	-6.5	-3.5
housing units delivered by contracting enterprises	-32.5	45.7	11.1
Procurement			
slaughter animals (including poultry)	-9.7	-5.9	-9.5
milk	-1.7	-1.8	0.2
eggs	-1.6	-1.2	-0.2
Retail Turnover			
of the main trade systems	2.4	3.3	4.2 ³
Foreign Trade⁴			
export to socialist countries	0.1	12.4	5.0
export to nonsocialist countries	-16.7	-0.8	7.5
import from socialist countries	-9.4	8.8	11.9
imports from nonsocialist countries	-39.3	-23.7	4.2
Personal Earnings ⁵	3.1	2.5	4.1 ⁶
of which income from wages ⁵	1.8	1.3	3.2
Actual cash expenditures ⁵	1.3	2.2	4.3

Footnotes:

1. Increases compared to actual 1981 results.
2. Increases compared to expected 1981 results.
3. All trade systems.
4. Data on actual results refer to actual transactions and the state plan (in contrast to overall actual results) does not include unplanned actions within the framework of cooperation, unplanned reexports trade, exchanges and conditional trade transactions, etc.
5. Data based on treasury plan of the SBCS (CS State Bank).
6. Including estimated interest on loans.

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CZECHOSLOVAKIA

NEW CEREAL VARIETIES DESCRIBED

Prague ROSTLINNA VYROBA in Czech No 4, 1982 pp 337-345

[Article by J. Schmidt: "Current Situation in the Assortment of Approved Cereal Varieties According to the Results of State Hybrid Tests"]

[Text] If we compare the yields of crops produced in our agriculture over the 5-year period 1950-1954 and over the 5-year period of 1976-1980, cereal crops demonstrate without any doubt the greatest increment. In addition to corn the greatest increase in yields of cereal crops was noted mainly in spring wheat (+92 percent) and winter wheat (+88 percent). Among the most efficient factors affecting the growth of yields is evidently the seed of productive hybrids.

However, the yields fluctuated in individual years due to the physiological reaction of the hybrids to weather conditions as well as to the harmful effect of diseases attacking them. In recent years hybrids were therefore tested so as to focus on more stable yields, whether by more adaptable new hybrids or by raising the resistance of new hybrids to diseases.

At the same time demands on the quality of the harvested grain were emphasized. The bonus system introduced in procurement of choice barley for malt and of wheat for processing in mills and bakeries provided the necessary economic incentive for our agricultural enterprises. Because the variety--the quality of the variety--is the carrier of indicators determining the quality of the grain, this interest was reflected in research for improvement of varieties and in the process of approving new hybrids for supplementing and modifying the assortment of cultivated varieties.

Material and Method

Varieties of cereals are subject annually to basic tests in 47 testing institutes of the Central Agricultural Control and Testing Institute and its counterpart in Slovakia, representing main conditions for agricultural production in the CSSR; all approved--regionalized--varieties as well as new hybrids registered for further improvement are tested annually. Experiments were conducted following all usual preplanted crops according to the sowing plan of the institutes. Nutrition averaged about 300 kg of pure NPK nutrients per hectare. Winter barley, rye and oats were sown only after cereal crops. The sowing was uniform, with the exception of that where the demands of the hybrid were considered. The area of the 15 square meter plots was harvested four times in succession, divided into random units.

The yields of grain were converted to uniform 86 percent solids and statistically analyzed by diffusion; their stability was established on the basis of regression coefficient. The yields of individual varieties were compared to the average yields of all tested hybrids. The resulting yields are quoted for 3 years, i.e., 1979, 1980 and 1981, other economic characteristics for 1981, except for the technological value which is based on the 1980 harvest.

Brief description of years during which the tests were conducted:

- 1979 -- Hard frosts in January and February; plants frost damaged.
Hot and dry weather in May and June; the number of productive stalks reduced.
Rains in late June; short growth; unaffected by disease.
- 1980 -- Autumn weather favorable; winter sowing good, offshoots well formed.
Spring cool; optimum number of productive stalks, more grains per spike. Growing season prolonged by 2 to 3 weeks; spikes diseased in some locations.
- 1981 -- Offshoots failed to develop in the autumn; spring dry, frosts.
May and June--warm and dry; fewer productive stalks.
Late in July unusual precipitation--occurrence of grain fungus;
grain sprouting in spikes; growing season reduced by 1 to 2 weeks.

Hybrid agrotechnology was recommended for the newly approved varieties on the basis of results of agrotechnical experiments conducted by the Central Agricultural Testing and Control Institute, namely: different precultivated crops, different sowing schedules, different sowing, different levels of N-nutrition, with growth morphoregulators, fungicides or insecticides.

Results and Discussion

Winter Wheat (Table I)

Czechoslovak winter wheat varieties approved in recent years for cultivation in key areas during the Seventh Five-Year Plan are hybrids of Soviet varieties which passed on to the new Czechoslovak hybrids better resistance against diseases or better quality of the grain.

The first hybrid of this generation--Slavia--will be soon supplemented by Vala, a plastic variety suitable for all areas of cultivation throughout the CSSR, and by hybrids Hela and Odra in areas with sufficient moisture; the grain of the two varieties is more suitable for baking and their high and stable yields have demonstrably exceeded the standard of the current assortment. Furthermore, a more recent variety, UH 192/19 approved in the spring of 1982, will be sown not only for its top yield but particularly for the above average quality of its grain which is comparable to Soviet varieties. The hybrid assortment still includes the classic, Moronovskaya 808, mainly in less intensive conditions, or Il'ichevka, a hybrid improved in the experimental cultivation maintenance institute in Cejc. The Amika variety demonstrates the highest stability among varieties resistant to yellow rust which is particularly harmful in corn-growing areas. Kosutka, a new hybrid which may be added to these varieties,

Table 1. Winter Wheat

Odrůdy 1	Povolenov v ČSSR 2	Výnosy zrna % ČSSR			Jakost zrna 4 1980	Vegetační doba 5 1981	Výška rostlin 18 1981	Odolnost proti polé- šení Q 1981	Odolnost proti rzi padl. 1981 10	Počet odnoží 1981 11	HTZ 1981 12
		1979	1980	1981							
Koštuka 14	1981	104	100	97	A2	-6	90	7	5	6	1,5
Mironovská SSSR 15	1966	101	90	95	A1	210	127	4	7	4	1,8
Ilijčovka SSSR 16	1974	100	93	99	A1	0	115	6	7	5	1,5
Mironovská zlepšená 17	1979	102	93	93	A1	0	121	5	6	5	1,5
Jubilejná SSSR 18	1971	102	95	96	A1	-1	108	6	3	3	1,6
Amika 19	1980	101	95	94	A2	0	102	7	5	7	2,-
Istra 20	1979	101	101	89	A2	-1	88	7	4	8	1,6
Solaris 21	1976	92	99	94	A2	-1	93	6	5	8	1,7
Odra 22	1981	108	107	106	A2	0	98	8	5	4	1,7
Hela 23	1979	106	106	104	A2	+2	104	9	5	5	1,7
Juna 24	1979	106	99	97	A2	+3	107	7	5	3	1,6
UH 192 25	1982	109	115	107	A1-2	+3	100	8	4	2	1,9
Mironovská přizkorostlá SSSR 26	-	-	94	99	A2	0	96	8	6	7	1,4
Vala 27	1980	106	107	107	B1	-1	92	9	5	5	1,4
Slavia 28	1976	102	106	104	B1	+2	95	8	4	5	1,6
Grana PLR 29	1974	108	106	98	C	+4	101	8	4	2	1,8
Mirela 30	1979	105	99	98	C	+5	114	6	4	2	1,8
UH 7050 n. s. 31	-	(115)	111	103	B1	+4	105	7	8	3	2,1
ST 129 n. s. 32	-	103	104	96	C	+7	106	8	8	7	1,9
SK 2365 n. s. 33	-	106	101	104	C	+1	90	9	4	8	1,7
BU 18 n. s. 34	-	-	108	106	C	+2	94	9	5	8	1,8

+) 100 % = průměr odrůd

35 Petarská jakost zrna: A1 = i pro zlepšování mouk, B1 = doplnková, C = slabá

Vegetační doba: + = pozdnější, - = ranější; u standardy počítáno od 1. ledna

36 Odolnost: 9-1 38 9 = největší, 1 = nejménší

HTZ (v g) = hmotnost 1000 zrn

39

Key to Table 1:

(1) Varieties	(30) Mirela
(2) Approved in	(31) UH 7050 newly developed
(3) Yield of grain percent CSSR	(32) ST 129 newly developed
(4) Grain quality 1980	(33) SK 2365 newly developed
(5) Growing season 1981	(34) BU 18 newly developed
(6) Height of plants 1981	(35) *) 100 percent = average of varieties
(7) Resistance against:	(36) Bakery quality of the grain: A1 = also for improving flour; B1 = supplemental C = poor
(8)	
(9)	
(10)	
(11) No of branches 1981	(37) Growing season: + = late, - = earlier; standard counted from 1 January
(12)	
(13) Days	
(14) Kosutka	(38) Resistance: 9-1 9 = highest, 1 = lowest
(15) Mironovskaya USSR	(39) HTZ (in g) = weight of 1,000 grains
(16) Il'ichevka USSR	
(17) Mironovskaya improved	
(18) Yubileynaya USSR	
(19) Amika	
(20) Istra	
(21) Solaris	
(22) Odra	
(23) HeLa	
(24) Juna	
(25) UH 192	
(26) Mironovskaya lowgrowing USSR	
(27) Vala	
(28) Slavia	
(29) Grana Polish People's Republic	

surpasses the Yugoslav hybrids not only in its early maturation but also in its resistance to freezing; its grain is suitable for baking. Some of the newly developed hybrids from the research institute in Stupice, are resistant to both yellow rust and grain fungus but they mature later.

Recommended Agrotechnology for New Varieties

Kostuka--suitable also for drier areas and not overly rich soils; appropriate for later sowing; higher sowing, i.e., 5 to 6 million sprouting grains per hectare; Retacel--0 to 2 kg per hectare; dosage of N-nutrition up to 100 kg per hectare.

Amika--exclusively for warmer areas; average soils; only better precultivated crops; early sowing; less abundant sowing, i.e., 3.5 to 4 million sprouting grains per hectare; Retacel--0 to 2 kg per hectare; dosage of N-nutrition--under 80 kg of pure nutrients per hectare; appropriate additional qualitative fertilization (until bloom).

Hela--for potato-growing areas as well as for Slovakia; average and better soils; not to be sown after cereal crops; must be sown early; average sowing, i.e., 4 to 5 million sprouting grains per hectare; Retacel not necessary; dosage of N-nutrition under 110 kg per hectare.

Vala--suitable for any areas, average and better soil, moist locations; not suitable for sowing after cereal crops; average sowing schedule; higher sowing, i.e., 5 to 6 million sprouting grains per hectare; Retacel not necessary; dosage of N-nutrition up to 110 kg per hectare.

UH 192--for beet- and potato-growing areas in Bohemia; good soil; suitable for sowing even after cereal crops; average sowing schedule; sowing average, i.e., 4 to 5 million sprouting grains per hectare; Retacel not necessary; N-nutrition up to 110 kg of pure nutrients per hectare.

Spring Wheat (Table II)

With the advance of winter wheat varieties suitable for sowing after cereal crops, the use of spring wheat has become increasingly more limited to replacement of the destroyed winter wheat. The assortment was expanded by Rena, a large-grain Czechoslovak hybrid which is more resistant to matting and to yellow rust. The Famos variety has the advantage of better branching and a better quality of the grain. The tested new varieties are suitable for improving the quality of grain (Turbo- [screening?]) or for improving their resistance to yellow rust (HE 406).

Recommended Agrotechnology for New Varieties

Rena--for any area and for warmer locations; good soil; may be sown even after cereal crops; higher sowing, i.e., 5 to 6 million sprouting grains per hectare; Retacel not necessary; N-nutrition up to 130 kg of pure nutrients per hectare; awned spikes.

Table II Spring Wheat

Odrůdy 1	Povolení v roce 2	Výnosy zrna % ČSSR 3			Vegetační doba 4 (1981)	Výška 1981 6	7 Odolnost proti poléhání 1980 8			Počet odnoží 1980 10	HTZ 1980 12	Pekařská jakost 1980 13
		1979	1980	1981			poléhání 1980 9	zrůstavání 1980 10	rostlinu na 1 11			
Jara 14	1975	5,47-	5,89-	5,69-	5 dny	126	97	6	2	1,5	41	C
Mephisto NSR 15	1975	103	103	102	+2	93	7	4-6	1,3	40	B 1	
Rena 16	1978	97	101	100	+4	78	8	6-7	1,6	45	B 1 - 2	
Famos NSR 17	1978	102	104	94	+4	85	7	3	1,7	39	B 1	
Turbo NSR 18	1980	106	101	99	+4	89	7	2	1,3	38	A 2	
HE 406 nř.		104	101	100	+3	73	8	8-9	1,5	39	B 2	
		96	100	102	+3	78	8					

Key:

- (1) Varieties
- (2) Approved in
- (3) Yield of grain--percent--CSSR
- (4) Growing season 1981
- (5) Days
- (6) Height 1981
- (7) Resistance against matting 1980
- (8) yellow rust 1980
- (9) HE 406 newly developed
- (10) No of branches 1980
- (11) per plant
- (12) HTZ 1980
- (13) Baking quality 1980
- (14) Jara
- (15) Mephisto FRG
- (16) Rena
- (17) Famos FRG
- (18) Turbo FRG
- (19) HE 406 newly developed

Famos--for colder areas, better and moister soils; tolerates late sowing; may be sown to supplement thinned winter wheat; average sowing, i.e., 4 to 5 million sprouting grains per hectare; Retacel 0 to 2 kg per hectare; dosage of N-nutrition up to 130 kg of pure nutrients per hectare.

Spring Barley (Table III)

After the extreme year 1981 the hybrid composition of spring barley will be fundamentally altered. Due to its lost resistance against fungus, Spartan, at present the most widespread variety, will be gradually replaced by the Koral, Krystal, Karat and Opal varieties whose resistance against fungus is inherited from donors I 25 and Palestine. Hybrids with different bases of resistance will be added to the assortment in order to reduce the risk that excessive spread of hybrids with resistance of a single biotype might deprive them of immunity.

Recommended Agrotechnology for New Hybrids

Opal--for warmer areas, average to good soils; may be sown after cereal crops; sowing average; with higher incidence of fungus, spraying with Calixin is necessary; dosage of N-nutrition 50 to 70 kg of pure nutrients per hectare; less suitable for sowing under crops.

Zefir--for any area; average and lighter soils; also dry locations; suitable even after cereal crops; sowing average; with higher incidence of fungus spraying with fungicide necessary; dosage of N-nutrition 40 to 60 kg of pure nutrients per hectare; must be harvested by combine promptly, 3 days before other varieties.

Krystal--for cooler areas, average to poorer soils; not very demanding; sowing possible even after cereal crops; sowing average; dosage of N-nutrition from 50 to 90 kg of pure nutrients per hectare; spraying against fungus not necessary; unsuitable for sowing under crops.

Karat--for cooler and moister areas (Bohemia), average and good soils with sufficient moisture; to be sown after root crops; sowing average; dosage of N-nutrition 40 to 80 kg of pure nutrients per hectare; spraying against fungus not necessary; less suitable for sowing under crops; 3 days late in maturing.

Fatran--for every area of Slovakia, average soil; to be cultivated after root crops and particularly corn; sowing average; dosage of N-nutrition 50 to 70 kg of pure nutrients per hectare; spraying against fungus necessary; unsuitable for sowing under crops; must be harvested promptly and not allowed to overripen.

Table III Spring Barley

Odrůdy 1	Povolenlo 2 roce	Výnosy zrna % ČSSR		Vegetační doba 1981	Výška rostlin 1981	7 odolnost proti poléhání 1981	7 odolnost proti padl. 1981	Podil zrna 1981	HTZ 1981	Sladárská jakost 1981
		3 1979	1980							
Favorit 13		5,35 ^(*)	5,97 ^(*)	5,69 ^(*)	5	117	67	7	6	78
Spartan 14	1973	98	98	96	0	68	7	7	6	78
Korál 15	1977	101	100	101	0	73	8	9	9	83
Opál 16	1978	99	99	97	0	68	7	7	7	77
Zefir 17	1980	96	99	-3	66	6	5	5	5	45
Krystal 18	1981	102	100	98	1	69	7	8	8	40
Karat x ⁽¹⁾ 19	1981	100	102	105	1	69	7	8	8	48
Tarzan x ⁽²⁾ 20	1980	(105)	(101)	(100)	3	69	7	9	9	43
Rapid x ⁽³⁾ 21	1976	(99)	(100)	(100)	0	70	6	6	6	43
ST 6984 nř.	22	(100)	(98)	(97)	1	70	7	8	5	41
HE 902 nř.	23	102	99	103	2	68	8	8	8	47
ST 6194 nř.	24	-	101	101	0	65	7	8	8	41
HE 1440 nř.	25	-	100	102	0	68	8	7	7	46
BR 1519 nř.	26	-	104	102	+2	70	8	8	8	41
		-	100	100	+2	69	8	8	8	45

(^{*}) 100 v_o = t na ha; (^(*) x¹) výsledky jen Čechy; (x²) výsledky jen kukuřičná oblast
Sladárská jakost zrna: A = velmi dobrá
B = dobrá
C = průměrná

Key:

(1) Varieties

(2) Approved in

(15) Koral

(16) Opal

(17) Zefir

(18) Krystal

(19) Karat x¹(20) Tarzan x²(21) Rapid x³

(22) ST 6984 newly developed

(23) HE 902 newly developed

(24) ST 6194 newly developed

(25) HE 1440 newly developed

(26) BR 1519 newly developed

(27) 1) 100 percent = tons per hectare; () x¹) resultsonly from Bohemia; x²) results only from the SSR;x³) results only from corn-growing areas.

(28) Malt quality of the grain: A = excellent

B = good

C = average

Winter Barley (Table IV)

Erfa, a hybrid from the GDR, will continue to be the principal winter barley variety. Nr 468, a new Bulgarian hybrid, prospers in corn- and warm beet-growing areas because it matures early and is resistant against fungus.

Recommended Agrotechnology for New Varieties

Nr 468--for corn-growing areas and warmer locations of beet-growing areas; schedule for sowing from 20 to 30 September after cereal crops; average sowing (4 million sprouting grains per hectare); dosage of N-nutrition 60 to 80 kg of pure nutrients per hectare; morphoregulator Terpal only for great density.

Winter Rye (Table V)

The share of Breno, a Czechoslovak hybrid, in the composition of winter rye varieties has increased to the detriment of the Dankovska Noya hybrid. Other new Czech hybrids are demonstrating the preconditions for a shorter and stronger stalk and thus, for more stable yields. Experiments with them will be completed in 1983.

Recommended Agrotechnology for New Varieties

Breno--for rye-growing locations, average and lighter soils; to be sown after cereal crops in the midterm prior to 30 September; sowing 4 to 5 million sprouting grains per hectare; dosage of N-nutrition 40 to 60 kg of pure nutrients per hectare; if sprayed with Camposan, the dose of N should be increased by 30 kg per hectare.

Oats (Table VI)

Veles and Pan, two new hybrids approved in 1981, will be a good addition to the composition of oat varieties. Both hybrids are more resistant against matting, produce excellent yield, and Pan, which matures later, is suitable for haymaking.

Recommended Agrotechnology for New Varieties

Veles--an early white-grained hybrid, for potato-growing and mountainous areas; average and better soils; to be sown after cereal crops; sowing 5 million sprouting grains per hectare; dosage of N-nutrient 60 to 110 kg of pure nutrients per hectare; suitable for sowing under crops; must be sprayed against both generations of grain fly.

Pan--semi-late yellow-grained hybrid, for potato-growing areas, average and better soils; unsuitable for dry locations; may be sown after cereal crops; sowing 5 million sprouting grains per hectare (up to 6 million for haymaking); dosage of N-nutrition 70 to 110 kg of pure nutrients per hectare; spraying necessary, particularly against the first generation of grain fly; suitable for sowing under crops as well as for haymaking.

Results of tests conducted in the institute in Stachy (Table VI) have demonstrated that repeated spraying of insecticides is highly effective against the first and second generation of grain fly.

Table IV. Winter Wheat

Odrůdy 1	Povolení v roce 2	3 Výnosy zrna %, ČSSR			Přezimování 1981	Vegetační doba 1981	Výška rostlin 1981	Poléhání 1981	8 Odolnost proti padlím 1981	Počet odnoží 1981	HTZ 1981
		1979	1980	1981							
16	1979	4,56	6,39	5,59	13	14	cm	9	9	9	15
Erfa (NDR)	1979	105	102	98	91	190(*)	85	7	7	7	38
Kiruna (NSR)	1979	89	98	98	91	1	86	6	7	6	35
Miraž (RSR)	1979	(91)	(106)	(97)	87	4	76	1	8	7	34
NR 468 (BLR)	1981	(91)	(110)	(104)	99	3	77	6	9	6	2,-

(1) 100 % t na h 20

(2) = výsledky jen z kukuričné oblasti 21

*) od 1. ledna 22

Key:

- (1) Varieties
- (2) Approved in
- (3) Yield of grain--percent--CSSR
- (4) Survival in winter 1981
- (5) Growing season 1981
- (6) Height of plants 1981
- (7) Matting 1981
- (8) Resistance against fungus 1981
- (9) yellow rust 1981
- (10) No of branches 1981
- (11) HTZ 1981
- (12) percent of plants
- (13)
- (14) Days
- (15) per plant
- (16) Erfa (GDR)
- (17) Kiruna (FRG)
- (18) Miraj (Rumanian Federal Republic)
- (19) NR 468 (Bulgarian People's Republic)
- (20) 1) 100 percent = tons per hectare
- (21) () = Results only from corn-growing areas
- (22) * = from 1 January

Table V. Winter Rye

Odrůdy 1	Povolené v roce 2	3 Výnosy zrny %, ČSSR			Prezi- mování 1981 4	Vegetační doba 1971 6	Výška rostlin 1981 8	9 Odolnost proti			Počet odnoží 1981 13	HTZ 1981 15	
		1979	1980	1981				poléhání 1981 10	plísni 1981 11	rzi žitné 1981 12			
Daněkovské nové (PLR) 16	1977	5,30*)	5,42*)	5,33)	5rostlin	7	dni	cm	139	6	9	6	14,2,4
Breno 17	1980	101	104	106	88	140*)			140	5	9	7	2,5
Kustro (NSR) 18	1970	105	102	102	85	2			132	5	9	6	2,7
KR 110 nř. 19	1980	100	97	98	89	2			135	5 .. 6	7	7	2,4
				103	88	0							33

*) 100 " t na ha 20
*) = od 1. ledna 21

Key:

- (1) Varieties
- (2) Approved in
- (3) Yield of grain--percent--CSSR
- (4) Survival of winter 1981
- (5) percent of plants
- (6) Growing season 1971 [sic]
- (7) Days
- (8) Height of plants 1981
- (9) Resistance against
- (10) matting 1981
- (11) fungus 1981
- (12) yellow rust 1981
- (13) No of branches 1981
- (14) per plant
- (15) HTZ 1981
- (16) Dankovské nove (Polish People's Republic)
- (17) Breno
- (18) Kustro (FRG)
- (19) KR 110 newly developed
- (20) 1) 100 percent = tons per hectare
- (21) *) = from 1 January

Table VI. Oats

Odrůdy 1	Povolenov v roce 2	3 Výnosy zrna % ČSSR			Vegetační doba 4 1981	Výška rostlin 1981 6	Poléhání 1981 7	HTZ 1981 8	Výnos suché hmoty 9	10 Výnos zrna Stachy 1981 postřik proti bzunce
		1979	1980	1981						
Diadem 14	1969	5,39 -	5,68 -	5,59 -	5	cm	9 - 1	g	12,22 +	efekt 13
Hermes 15	1978	100	97	95	129	109	4 - 5	35	7,75	3,02
Fjärmingsnova 16	1979	103	99	101	1	103	6	31	5,22	2,81
NSR 17	1981	98	100	102	2	97	6	31	5,21	2,93
Pan 18	1981	99	102	103	2	104	7	35	4,92	3,27
Veles 19	1981	100	102	99	0	96	8	36	4,62	2,87
Saturn	1976	jen pro senáž 20			2	(128)	7	(37)	100	

) 100 % = t na ha 21

Key:

- (1) Varieties
- (2) Approved in
- (3) Yield of grain--percent CSSR
- (4) Growing season 1981
- (5) Days
- (6) Height of plants 1981
- (7) Maturity 1981
- (8) HTZ 1981
- (9) Yield of solids
- (10) Yield of grain in Stachy in 1981
- (11) Control
- (12) Second spraying
- (13) Result
- (14) Diadem
- (15) Hermes
- (16) Flaemings FRG
- (17) Pan
- (18) Veles
- (19) Saturn
- (20) For haymaking only
- (21) 100 percent = tons per hectare

UNPRECEDENTED NEED FOR MULTILEVEL AGROINDUSTRIAL COOPERATION SEEN

Budapest NEPSZABADSAG in Hungarian 15 Jul 82 p 3

[Text] In the sixties, one-quarter of material outlays for agriculture originated in industry. Today industrial products account for over half of such outlays, and the percentage is increasing steadily. This year agriculture will use domestic machinery, parts, technical and chemical goods valued at about 40 billion forints. Of the machines purchased for agriculture, barely more than 40 percent will be Hungarian made; in the case of chemicals, agriculture can meet two-thirds of its needs from domestic sources.

At a recent joint meeting of the ministries of agriculture and industry, it was resolutely affirmed that these two major branches of the economy must work in the closest possible collaboration to the benefit of both. To a great extent, the quality of this cooperation will determine their capacity. This becomes a matter of interest far transcending the interest of individual portfolios.

If industry is considered solely as a manufacturer of agricultural production equipment, then agriculture is clearly the buyer. In this sense, agriculture is industry's largest domestic market. Therefore it is essential for industrial efforts to be in harmony with agricultural possibilities. Naturally there may be and are conflicts. For one thing, domestic agricultural demand in itself does not permit production in series sufficiently great to make production profitable. For another, the requirements of agriculture are demanding. A judicious and discerning industrial policy can link these two factors to great advantage. To a certain extent industry can consider Hungarian agriculture its showcase. Equipment that performs well here will sell readily on demanding foreign markets. However, the product must also be economical to use. Unfortunately, this view has not yet taken root in industry. There is a tendency to depict agriculture as an obstinate, unreasonable customer. Yet our agriculture can become competitive only with production equipment which is on par with the best on international markets. For this concept to gain ground, a new outlook and an enterprise organization adjusted to it are necessary. In many parts of the world, producers of agricultural equipment literally court their customers; the reverse is true in Hungary. Farms have had to make their needs known to industry without being fully aware of precisely what industry is capable of. This has often resulted in the import of the latest foreign equipment while our farmers were wishing that Hungary would produce its equivalent. The resulting

debates which often ended in ruffled feelings are fortunately subsiding. There are now numerous examples to prove that Hungarian makers of chemicals and machinery can provide merchandise equal to the best made abroad. In fact, there is a trend toward product development so that Hungary is keeping abreast of international technical development in a number of areas.

In line with the economic reform, a new practice is evolving: It is based on economic relations founded primarily on enterprise independence rather than official relations. It is very important for the two ministries, agriculture and industry, to act in concert in formulating the joint production development policy agenda, in setting the economic regulators and incentives through which such a policy can be implemented. But it is equally important to establish better cooperation between the producing enterprises, commercial organs and farms involved. The production cooperation between Babolna and several pharmaceutical companies, the connection between the Taurus rubber goods enterprise and number of large farms or the relations between the Borsod Chemical Works and the agricultural testing facilities of other industrial plants are examples of agroindustrial cooperation which bear emulation.

Naturally, it is unrealistic to believe that agriculture's wide-ranging needs for industrial products should be met entirely through domestic production. This has been unfeasible in the past and will remain so. Nevertheless, the proportion met through domestic supply should not only be greater but of higher quality. This intention to cooperate which is unprecedentedly strong will benefit both parties and lead to improved performance and efficiency. Amid the many problems and difficulties besetting our economic life today, the effort at continuous renewal has become the most characteristic trait of the economy. Such renewal offers an exceptionally good opportunity for rethinking and expanding relations between our industry and agriculture.

CSO: 2500/325

PROFITABILITY OF WHEAT PRODUCTION REVIEWED

Budapest FIGYELO in Hungarian 16 Jun 82 p 13

[Article by Margit Janky: "The Price of Wheat"; passages enclosed in slant-lines printed in italics]

[Text] Significant portion of the income from large enterprises' basic function is from wheat. In the past decade, the rising cost of materials and machinery necessary for production were only partially offset by simultaneous growth in market price and yield.

The rise in wheat's world market price was predicted to be more than the rate of inflation, but such increases in domestic purchase prices cannot be expected. Therefore, although the profitability of wheat export could improve, the sector's profit position can only be maintained by raising the yield average based on sensible economizing, by stricter adherence to technological specifications, and by improving the quality of the crop.

Change in Production Costs

In the past decade the sector's intensive development and the price changes that took place in the meantime raised the cost of wheat production significantly. In the Fifth Five-Year Plan period the production cost of 1 hectare wheat in the cooperatives--where about 85 percent of the area is planted in wheat--was 81 percent higher than the average of the previous plan period.

/The value of materials used/ for the production of 1 hectare wheat increased one and a half times in the past 10 years, and the average of 1976-1980 surpassed the previous 5 year average by 38 percent. This was the result of price increases of fertilizers and pesticides, decrease of endowments, more fertilizing, and more widespread use of modern pesticides [insecticides and weed killers].

In the past [few] years the value and cost ratio of services by ancillary facilities has increased exceptionally. This accounted for 50-60 percent of the cost increases in 10 years. The amount of mechanized work necessary for production barely increased in this period, so the source of the cost increases was basically the change in prices of machinery, spare parts, fuel and lubricants.

Wheat production is one of the least labor intensive sectors of agriculture. Therefore the circa 30 percent decrease in wage costs in the Fifth Five-Year Plan period did not substantially influence production costs.

However, the so-called other direct costs increased almost threefold in the past 5 years. Their cost ratio also doubled, approaching 10 percent. In the last analysis, this increase can also be attributed to price changes in industrial and energy resources, which have also altered the cost of services, insurance tariffs and other cost factors.

The price increases of course affected the main sector and general agricultural costs too, which in the years 1971-1978 doubled in the agricultural cooperatives. The new method of general cost apportioning introduced in 1979 further increased the sector's burden. Namely, instead of the previous apportioning based on prices received, the direct cost excluding materials has become the basis for general cost projections. This has basically increased the agricultural sector's general cost ratio, mainly in those branches where the material cost ratio is otherwise relatively low (wheat production is like this also).

In the past decade the size and make-up of production costs in cooperatives approached that of the state farms. And because 85 percent of the wheat fields belong to cooperatives, wheat production cost increases nationwide over 10 years can be estimated at 220 percent.

Competing Branches

There was a more than 3,800 forint per hectare difference between the average wheat production costs of the two plan periods, which even the increased yields and procurement prices could not offset. Therefore in the cooperatives the income per acreage also decreased.

Despite the 1981 increase in wheat procurement prices (wheat for improving 6 percent, wheat for milling 6.5 percent, for fodder 9 percent) only by increasing the yield without additional investments can the profitability of the sector be maintained. The question is, however, how long this tempo of increased yields to approach the cost increases can be sustained. We cannot be too optimistic in this area.

That is, the excellent wheat harvest in 1980 was influenced by results of large doses of fertilizer used in previous years. Inasmuch as in years to follow they will try to maintain the income level by reducing the invested costs, this will sooner or later become an obstacle to intensive development.

Wheat's decreasing earnings per unit of land can also cast doubt on its competitiveness relative to other cultivated crop branches. In examining the competing branches with regard to varied soil conditions, it can be said that wheat will give the largest return in poorer soil, sunflowers in average soil and corn will yield a value of over 30 gold crowns per hectare on excellent soil.

Indicative of the sensitivity of the branches to soil quality is that the earnings per hectare of wheat at 10 vs. 35 gold crown [soil] value increases three times, of sunflower nearly 6 times, and of corn more than 13 times. Therefore /corn production can compete with wheat only in the best soils. Sunflower, however, can be a rival of both of our main cereal plants even in average soils/. In poorer soils the branch's earnings position is further improved by the supplementary price given since 1982.

Rapid Reaction

The security of wheat production is quality improvement. The crops quality structure have been basically determined by the production earnings ratio of different consumer value species.

Fodder-wheat's earnings per land unit in 1976-1977 exceeded that of table-wheat by 24-29 percent; by 1978 the profitability of these two species had reached roughly the same level, then in 1980 the per hectare earnings of table wheat became nearly one and a half times that of fodder-wheat.

The producers quickly reacted to the change in profitability, and so the fodder-wheat's circa 30 percent ratio nationwide for years 1977-1978 fell to below 20 percent for 1980. Further reduction in the ratio is curbed by the producer's internal need. However, if in the future new, larger yield fodder-wheat species come into production, then between the two type-groups the previous earning ratios could take shape, which would lead to a reduction in the ratio of land planted in table-wheat. Therefore it is important, /that the modernization of species selection be continuous in the table as well as in the fodder-wheat/.

The procurement price of table-wheat up to 1980 (uniform price of 2,950 forints/ton) did not stimulate quality improvement. The essence of the new wheat receiving system introduced in 1980 is that the producers turn in the wheat with a species guarantee, and the baking industry value of the so-called improving-wheats is determined by laboratory tests. So the procurement price of table-wheat varies according to quality: in 1980 the mill quality price was 3,100 forints per ton, the improving quality was 3,250 forints.

Procurement prices in 1981 further increased: mill quality to 3,300 forints per ton, improving wheat to 3,450 forints, and fodder-wheat to 3,050 forints. Simultaneously (based on the results of theses objectively studied in 1978-79) they determined those species which are suitable for the production of improving-wheat.

The area planted in these species, because this group includes the newer table-wheat species that can be successfully cultivated in all regions of the country increased significantly in latter years. Their average yield, however, because it is grown everywhere regardless of soil quality, is not on par with the species lesser valued by the baking industry and produced on smaller areas.

For improving-wheat crops to attain the desired quantity, quality, besides the ecologically suitable soil qualities it is necessary to employ special, quality improving agrotechnical methods. But these usually involve excess investment, thus cost increases.

The Premium Price of Quality

Beyond this, to achieve excellent quality crops a broader viewpoint, technical know-how and better equipment is also necessary. Fundamental task is to avoid the mixing of species. But in the receiving granaries improving-wheat cannot be stored separately even for the time it takes for the laboratory tests. Therefore the producers should assume the storage of these also. But in the years 1980-1981 the procurement price for improving-wheat was only 150 forints per ton higher than for milling wheat. Taking into account the aforementioned excess costs, this did not return more profits than mill wheat. Resulting mainly from this, in 1980 in national average only 10 percent of the improving-wheats harvested met quality standards.

In 1982 the fixed price of improving-wheat's fixed, official price was done away with. In production contracts its quality premium price is 250-400 forints per ton, which somewhat improves the sector's profit position, but does not settle the problem of larger scale production. A 600 forints per ton production premium surplus can be attained by extending production of the poorer quality, but very high yielding table-wheat species.

The increase in improving-wheat production is important not only in the interest of providing raw material for the food industry, but by selling it on the export market, it increases the foreign exchange income of export wheat. But for this, the producers should receive such a quality premium price to assure higher income than from mill wheat; this would encourage the production of lower yield, but excellent quality baking industry species and the employment of quality improving, preserving techniques, and the acceptance of larger risks. The production of these should be concentrated in regions of the country with suitable ecological endowments, by producers who take responsibility for using special production methods and have suitable facilities.

9918
CSO: 2500/287

LASER UTILIZATION IN RAILWAY CONSTRUCTION DESCRIBED

Budapest VASUT in Hungarian No 5, May 82 pp 10-12

[Article by Lajos Karaus: "Laser Utilization in Railway Construction"]

[Text] The invention and practical use of lasers has a short past. In the summer of 1960, T.H. Maimann, scientist of the California Hughes Aircraft Co, introduced the first ruby laser. Today, lasers are successfully used in many fields of science and technology.

The Generation of Laser Light

The technical term laser is an English acronym which means: light amplification by stimulated emission of radiation (the Hungarian translation is: "light amplification by induced emission of radiation").

According to the generation method of the laser light, there are continuous-operation gas lasers, pulse-operation solid body and liquid lasers and semiconductor lasers which operate both in the continuous- and the pulse-operating mode. If external energy is conducted to a homogeneous substance, e.g., a ruby crystal or helium-neon gas mixture, light waves are created, which cause at certain atoms of the substance--if they collide with them--the emission of further light waves of identical nature. Under the influence of the introduced energy, the generated light becomes stronger.

The theoretical structure of a laser device is shown in Figure 1.

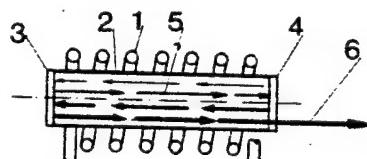


Figure 1.

- Key:
- | | |
|-----------------|---------------------------------------|
| 1. Energy input | 4. Partially translucent plane mirror |
| 2. Ruby crystal | 5. Amplified ray |
| 3. Plane mirror | 6. Laser beam |

This is a ruby laser which consists of an energy supply (1), ruby crystal (2), plane mirror (3) and a partially translucent mirror (4). In this case, the homogeneous substance is the ruby crystal. In the laser device, that portion of the light which is parallel to the longitudinal axis of the substance body (perpendicular to the mirror) is further amplified under the influence of the energy. The light waves in the ruby stick bounce back and forth between the mirrors, and thus reach an intensity which allows them to exit from the device via the partially translucent mirror. This exiting light beam is the so-called out-coupled laser beam.

Practical Use of Lasers

In its track-regulating machines, the Austrian Plasser and Theurer Co has been using for nearly 20 years a variety of automatic and semiautomatic track-leveling and track-directing systems. The controlling of the leveling is accomplished via infraoptical means for the 06 series Plasser machines in MAV inventory and via a string system for the 07 series; for both series, the controlling of the directing equipment is accomplished via a string system. With both series, the level and directional faults of the track can be influenced--depending on the work method used--by two different methods.

--When the method to clear a fault is used, the track must be measured in advance via a leveling device and the measured fault-removal data must be written on the crossties. The person operating the machine feeds the data written on the crossties into the control systems of the machine.

--When the method to reduce a fault is used, the track does not have to be measured in advance, but rather the machine senses the track faults and reduces them without external intervention--in accordance with the technical construction of the machine--i.e., the faults are not removed.

From the two known methods, the fault clearance method is the one which results in the accurate positioning of the track; for this, however, the level and directional state of the track must be measured for every three to four crossties, and the results must be written on the crossties. This work method is rather lengthy and requires thorough preparation, especially if the data must be processed by a calculator.

This track-measuring process can be facilitated; Plasser and Theurer also implemented the laser control of the machine for 07 series track-regulation machines. The high directional accuracy of laserlight allows the use of a guidance beam which is suitable for the automatic control of the track-regulation machine.

Advantages of Laser Beam Utilization

--A high level of accuracy because of the continuously existing guidance beam;

--the plotting and checking measurements performed by conventional geodesic methods are no longer needed;

--the evaluation and processing of measured data (calculator, etc.) are no longer needed;

--the measuring personnel do not have to be reserved;

--a high daily or specific output.

The 07-32 SLC model track regulating machine employed in our technical service is equipped with a laser device.

The laser control system consists of two main parts:

--laser transmission system;

--laser receiver system with the associated control unit.

Laser Transmitter System

The Plasser Co uses the helium-neon laser device manufactured by the Siemens Co to produce the laser beam; this is equipped with a special optical device. The less than 1-mm diameter laser beam exiting from the laser tube is magnified by the special optics and dispersed in a fan-shaped pattern. The laser tube can be operated on a battery (12V, 1 ampere) because of the low power draw (approximately 12 watts).

Some of the most important technical data of the EL-T-461-02 helium-neon laser tube employed on the 07-32-SLC track regulating machine:

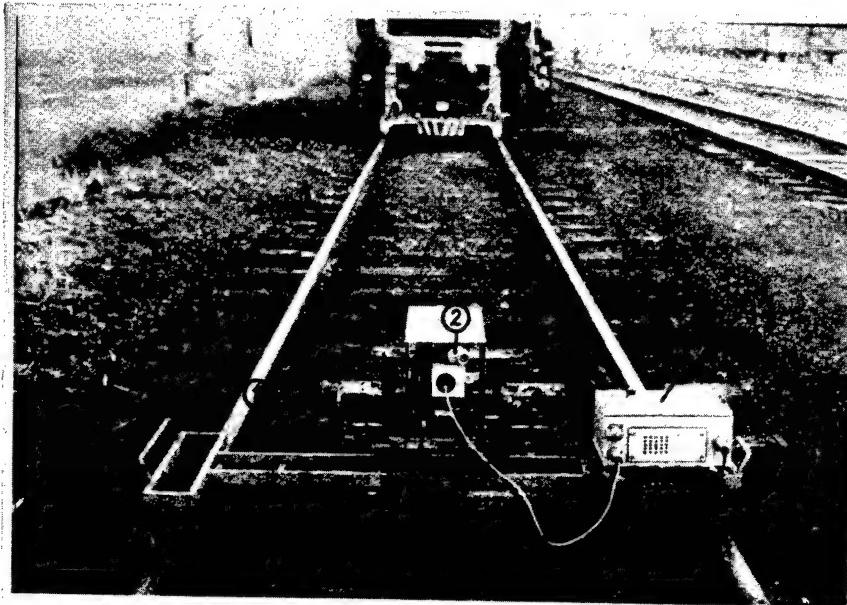
Beam wavelength	632.8 nm (red)
Beam power	1.0 mw
Modulation frequency	17.75 khz ± hz
Directional stability	±3 • 10 ⁻⁶ rad/°C
Maximum effective range	400 m
Operating temperature	-20°C to +40°C

The battery can be charged by the battery charger built into the track regulation machine or by an independent charger.

Laser Receiver Equipment

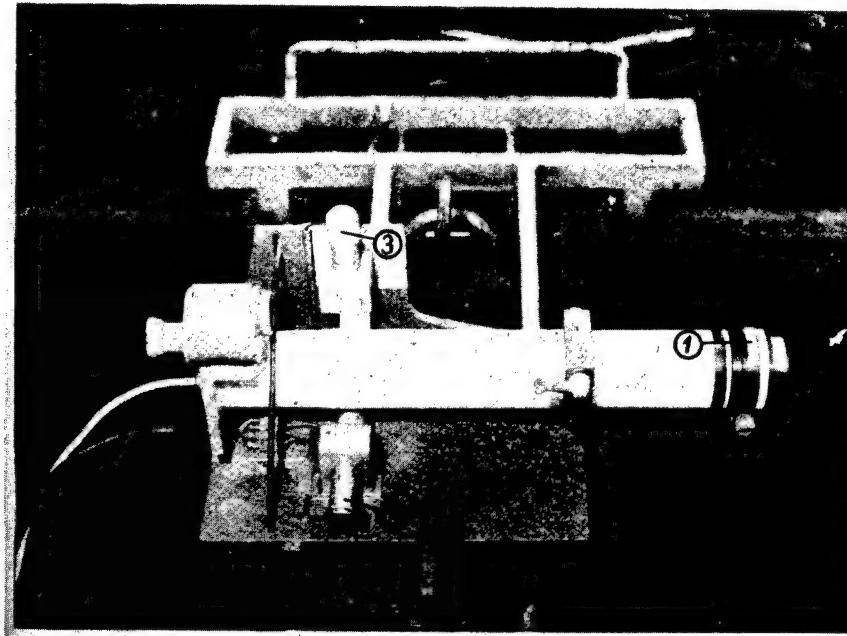
The receiver circuit consists of two parts: the laser receiver head and the control circuit. The photoelement groups, signal amplifier and compensator or differential and mid-range signaling circuit units are found in the receiver head.

The photoelectric laser receiver senses the laser beams with high accuracy. The sensing is accomplished via the photoelements. The photoelements amplify the received laser signal. There is an amplifier circuit associated with the photoelement groups. Via the compensator stage, the two amplifiers supply the electrical signal for the operation of the automatics. If the two photoelement groups are identically lit by the laser beam, the amplified signals cancel each other, i.e., there is no signaling.



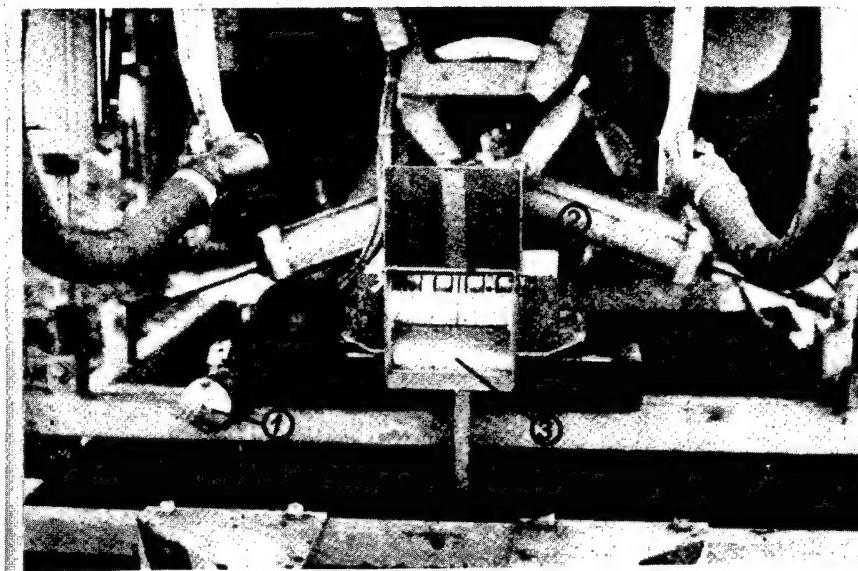
1. Hand wheel
2. Guidance telescope
3. Laser control box
4. Read-off sticks

Figure 2. Laser Transmitter Car Unit



1. Level indicator of cylinder lens
2. Slow motion screw
3. Guidance motor

Figure 3. Principal Parts of the Laser Transmitter and Attachment



1. String-setting motor
2. Laser receiver protective hood
3. Laser receiver

Figure 4. Laser Receiver System on the Track-Regulation Machine in Operating Position

If the laser receiver is positioned to the left or the right of the fan-shaped laser plane, then the amplifier of the illuminated photoelement group emits an electrical signal via the evaluation stage for the operation of the automatic control system.

Some of the most important technical data of the EL-T 461.05/06 laser receiver:

Operating range	over 300 m
Accuracy	± 1.5 mm over 300 m
Supply voltage	12-volt battery, same as on the laser transmitter
Power requirement	approximately 6 w
Temperature range	from -20°C to +40°C
Output protected from spilled water.	

Technical and Practical Design of the Laser Directing System

The laser transmission equipment along with the supply unit and other mechanical elements are placed on a manually movable small car (Figure 2). The horizontal and vertical positioning of the laser tube is accomplished by an electromotor (Figure 3). Before the machine can be automatically operated under control of the laser beam, the laser beam must be adjusted to the zero reference position of the laser receiver by the directional motors.

The laser receiver photoelectric device is installed on a movable sled positioned in the front of the track-regulating machine. (Figure 4).

With the rotation of the screw shaft, the laser beam moves the laser receiver on the sled perpendicular to the track axis via the control system. The first end of the track-guidance string moves together with the laser receiver. If the laser beam is directed to the zero setting of the laser receiver and the string-replacement selector switch is set to "laser operation" in the control cabin, the effective track-regulating operation is ready to start with the machine. After this, the compensator automatic keeps the center of the laser receiver in the direction of the laser beam.

Prerequisites of Laser Operation

The track section to be directed by laser must be designated approximately every 200 meters. In the designated points, the desired displacement values of the track axis must be written on the crossties in mm. In the vicinity of these points, on an appropriate fixed column (a column supporting the upper electrical wires, a sectional stick, etc.), the distance between the column and the track axis must be written. During the performance of this task, great care must be taken to keep the designated points in one line, since this is the only way to guarantee the uninterrupted guidance of the longer track section.

Laser guidance can be performed even when the track is not designated. In this case, relatively well-located points must be found by visual inspection and these must be regarded as zero. Track regulated in this manner is seemingly well located, but its axis does not necessarily coincide with that of the originally planned (designated) track.

Figure 5 is a schematic representation of the arrangement of the track-regulating machine relative to the guidance laser system along the railroad track.

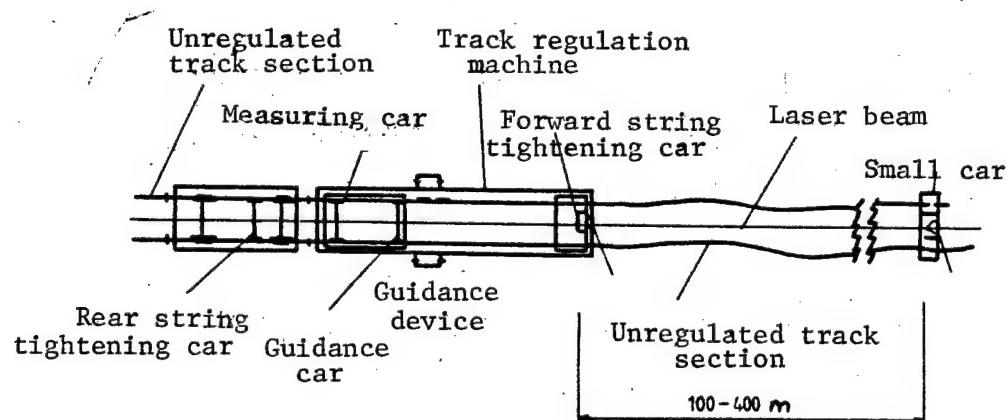


Figure 5

Process of Laser Guidance

Under way to the workplace, the laser transmitter is positioned at an appropriate place on the track-regulation machine. At the workplace designated for the machine, the car containing the laser transmitter must be removed from the machine, placed on the track in front of the machine and, depending on the weather conditions, pushed 100-400 meters forward up to a previously designated point and attached to the track. If the track is not designated, a relatively well-located point must be found, which is regarded as zero. The adjustment of the laser beam to the base position after the car has been attached is the task of properly trained personnel of the track regulation machine.

The laser beam is recommended to be set to the base position if the red indicator lamp positioned in the front of the machine continuously flashes any of the lateral white-light lamps.

After the base position is set, if the string-displacement selector switch is set to "laser operation," the work must be started with the machine. The string displacement, i.e., the directing of the track is henceforth performed automatically, without external intervention.

Ten to 15 meters before the laser transmitter, the machine in operation must be stopped and the transmitter must be advanced to a new designated point. After the base position is reset in the described manner, the work can continue.

With the gradual advancement of the laser transmitter, track conforming to the accuracy requirements of railroad track specifications can be produced.

The guidance activities of railroad tracks can be successfully performed with laser beams using the currently available system.

The Austrian Plasser-Theurer Co is involved with the development of a laser receiver system which also allows track-leveling operations. The laser control of the leveling system is made difficult by the constant changing of the slope conditions of the railway track.

With the use of lasers, the track construction service has made a big step forward in the area of the practical application of research achievements.

9901
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MIXED EAST-WEST ENTERPRISES ARE USEFUL, EXPAND SLOWLY

Budapest HETI VILAGGAZDASAG in Hungarian 26 Jun 82 pp 26, 27

[Article by Eva Kortvelyes: "Mixed Doubles"]

[Text] Mixed enterprises represent one of the forms of East-West industrial cooperation. Being able to obtain modern techniques and technologies is an advantage for the socialist countries, and in this way the opportunities may open up for the capitalist firms to, for example,--by using certain countries as bridgeheads--open up the socialist market. Yet this type of mixed enterprises are not multiplying like wild mushrooms, either in Hungary or in the other socialist countries.

Since the Ministry of Finance defined in 1972 the operating rules of mixed enterprises that can be created in Hungary with foreign capital, seven such firms have come into existence. The first one was formed under the name of SICONTACT KFT. [SICONTACT Limited Liability Company] in 1974 with the participation of Siemens, the newest one was formed in 1981 under the name of Sphero-EVIG KFT. with West German and Swiss participation. Five of the seven are operating in the production sphere, one in services, and one in banking. (HETI VILAGGAZDASAG 27 February 1982) According to the experts, seven enterprises in 10 years is a modest result.

But why would it be worth it to enter into this business format, anyway? Gyula Haraszti, the titular department head of the Ministry of Industry lists the advantages: "The mixed enterprise provides an opportunity for Hungarian economic units which up to now have been swimming in the middle of the field, to break into the front lines--and not only in domestic waters--, by obtaining modern technology and methods. It provides a good opportunity for us to join in the international sharing of work more actively. This will make the selling conditions of Hungarian products more favorable, especially if we also consider that generally the foreign partner has a well developed marketing organization which the Hungarian partner can also use in the case of a mixed enterprise. In addition to this, the traditional exporting of goods is meeting with more and more obstacles. By setting up a mixed enterprise these obstacles can be overcome in part, which by itself is a result not to be belittled. And finally one must also not forget the

important fact that in the present times when capital is running low, the establishment of mixed enterprises represents the attraction of additional currency resources into the Hungarian economy. Of course nobody considers the mixed enterprise format to be the sole format of salvation, but this opportunity must also be used more in the future than it has been in the past."

Hearing so many good things, someone could justifiably ask: in the last 10 years why did not these mixed enterprises multiply like wild mushrooms? A study has recently been completed in the Ministry of Industry and it provides some partial answers to this question. Fifty leading production and foreign trade enterprises--doing significant nonruble-accounted export--were asked: in what do they see the obstacles in forming this kind of mixed enterprises?

According to the interested parties the biggest obstacle and the one most difficult to bridge is that the capitalist partners--because of the decrease in the capitalist market--are interested primarily in expanding on the socialist markets. Therefore practically their first requirement is to fully or almost fully exclude the jointly produced product from the capitalist market. The increased difficulty of selling on the capitalist market and the increasing unemployment in the Western European countries represent big problems nowadays.

Selfcritical opinions can also be found here and there in the ministry's study. The resistance within the enterprise resulting from conservative thinking must also be overcome, and in addition to this there are few experts fit to manage enterprises with more independence than the domestic ones have. There were also many complaints about the procedure of obtaining the permits.

Beyond the fact that the present East-West political atmosphere is not the most favorable for accelerating the influx of capital, the domestic financial experts relate the relative lack of interest by foreign enterprises to insufficient incentives in our financial regulations. According to the directions by the minister of finance the mixed enterprises, after forming the participation and risk funds, must pay a 40 percent association tax, while other countries are trying to attract foreign capital with sizeable concessions. In Ireland, for example, the mixed enterprises formed by 31 December 1980 with foreign capital are completely free of taxes until 1990, while the ones established after 1981 pay a small tax of 10 percent on their profits until the year 2000. Hungary's United Incandescent has also exported capital here. (HETI VILAGGAZDASAG 1 May 1982.) Favorable amortization is also offered in Ireland, a certain percentage of the cost of training manpower is rebated, and concessions are made in case the profit is reinvested. This latter also exists in this country, but it is not mandatory.

"We should also consider offering similar concessions"--said the above already quoted titular department head of the Ministry of Industry. Based on the problems mentioned earlier, regulations were born in the first years of 1982 making it significantly easier to make investments in Hungary with foreign

participation. For example, the statute makes it possible to transfer back home the achieved profits in proportion to the foreign capital invested. If establishment of a facility with especially great significance, or an especially advantageous business is involved, then the now general maximum share of the foreign capital (49 percent) can be even higher. There will be no direct connection in the future between the number and distribution of directors and the distribution of capital, that is, even with 49 percent foreign capital participation it is possible that complete management (the directing of the enterprise) will be in the hands of the foreign partner with minority participation.

Seven mixed enterprises seem to be too few, but there have also been instances when even though a foreign partner had the initiative, he could not implement it because he was not familiar with the opportunities and conditions, that is, there was no suitable foreign language information material. This problem now belongs to the past. The publication entitled "Economic Associations in Hungary with Foreign Participation" has been published in foreign languages by the Hungarian Foreign Trade Bank. This briefly informs foreigners about Hungary's economic management system, about the advantages of setting up mixed enterprises, and about the legal and financial conditions of establishing them.

Naturally, verbal information and generating attention continue to play an important role. We must make use of the programs we organize abroad--for example, the Hungarian Weeks--and the various conferences, for this purpose. Thus, for example, most recently the establishment of mixed enterprises was one of the central topics of the Tokyo session of the Hungarian-Japanese Economic Club. The Hungarian party was thoroughly prepared: it made proposals in eight concrete topic areas to the Japanese party for setting up mixed enterprises in Hungary. Among other things they discussed the possibilities of jointly producing pumps, heavy manipulators and robots, as well as packaging machinery and equipment.

Simply informing one party is not enough. Greater activity by the Hungarian enterprises is also an indispensable condition for creating mixed enterprises. "The Ministry of Industry not only supports but also encourages the enterprises to set up mixed enterprises"--Gyula Haraszti declared. The list of Hungarian enterprises desiring to establish mixed enterprises in the future for the production of various products, was born on the basis of this. Such a "matrimonial ad" can also be found in the information pamphlet published by the Hungarian Foreign Trade Bank. But the small number of enterprises engaging in it allows the conclusion to be drawn that the Hungarian firms are not overflowing with activity.

Thus it appears that neither the domestic nor the foreign enterprises are wearing themselves out to be able to play "mixed doubles". The recession dragging on in the West, and the unfavorable international political atmosphere do not favor the influx of foreign capital into Hungary. And in this situation we also must not expect great results from having made more favorable the conditions of foreign capital operating in this country, or from more abundant information.

MAY PRODUCTION FIGURES PUBLISHED

Warsaw ZYCIE GOSPODARCZE in Polish No 22, 20 Jun 82 pp 6-7

[Text] It has been a long time since we have not felt anxiety with respect to the possibility of an optimistic reading of industrial production data. Comparison with analogous months of last year confirmed the implacably continuing tendency for declining production. Solid production from socialized industry was only 3.7 percent lower in May as compared to last May, but it rose by 0.2 percent as compared to April. Thus, the catastrophic breakdown of industrial production, which was characteristic of the second quarter of last year, was not repeated in May. And after all, external conditions for production, tied to the import supply from the capitalist countries, were decidedly more difficult this year as compared to last.

The second quarter of last year was exceptionally bad for socialized industry. In April of last year, production by socialized industry declined by 9.4 percent as compared to March, and by another 3.9 percent in May as compared to April. From April to June 1981, the production decline by socialized industry as compared to 1980 achieved a record level of 11.9 percent by April, 17.6 percent in May, 16.6 percent in June and 16.8 percent in July. The average annual decline in industrial production in 1981 as compared to 1980 was 13.8 percent.

We would like to warn against an exaggerated exposure of the tendency toward economic stabilization, when the symptoms can still appear to be not very permanent. It is especially unknown what the import possibilities to supply industry will be in the third and fourth quarter of this year. Various unknown also concern agriculture in which, despite a certain improvement in the procurement of slaughter animals, signals indicating a threat to animal husbandry have not abated.

Above all, the mining industry has reduced the production decline in socialized industry. In May of this year, production sales from this industry increased by 14.3 percent as compared to last May, and by 8.4 percent in the first four months of this year as compared to the same period last year.

In May, 15.8 million tons of hard coal were extracted, a 22.3 percent increase over last May's figures and an increase of 14.8 percent for 4 months. In May of last year, a decline of 7.2 percent in coal extraction occurred as compared

to April, and of 12 percent as compared to March 1981. This May, more or less the same amount of hard coal was extracted (in natural units) as in April, and 7.5 percent less than March.

Furthermore, other indicators of the production of more important commodities in the mining industry were better this May as compared to last. For example, there was an increase of mined brown coal per million tons of 1.5 percent this May as compared to last May, and a decrease of 1.9 percent for 4 months; production of electrolytic copper per thousand tons up by 11.8 percent in May and down by 1.6 percent for 4 months; lead per thousand tons up by 32.3 percent in May and also up by 2 percent for 4 months; electric energy per billion kilowatt hours up by 0.2 percent and down by 0.3 percent for 4 months.

Also reduced in May as compared to previous months (in relation to the same period last year) was the decline in aluminum production of 24.2 percent versus 44.2 percent for 4 months.

A certain worsening occurred, on the other hand, in the production of coke from hard coal (a production decline of 6 percent per million tons in May versus 3.1 percent for 4 months); natural gas (a decline in May of this year per million cubic meters of 17.6 percent and a decline of 7.4 percent for 4 months); zinc (a decline in May per thousand tons of 20.0 percent and 11.1 percent for 4 months) and cement (a decline in May per million tons of 2.2 percent and 1.5 percent for 4 months).

In the processing industry, the production decline in May as compared to last May was 4.8 percent versus several percent for the first 4 months of the year. In some branches of the processing industry, it was possible in May to confirm a reduced production decline by even a few points as compared to last year through a comparison of data for 4 months. Within the electromachine industry, this concerned transportation means (a production decline in May as measured in 1982 prices reached 3.3 percent and 14.6 percent for 4 months), and electro-technical and electronics products (a production decline in May by 0.01 percent, and 14.5 percent for 4 months).

In the chemical industry, a decline in production in May (as compared to last May) reached 4.2 percent, and 14.3 percent for 4 months. An analogous production decline in the wood products industry reached 3.6 percent in May, and 11.6 percent for 4 months. May production in the paper industry increased by 1.5 percent, while it decreased by 6.4 percent for the 4-month period.

Other similar data from other more important branches of the socialized processing industry are as follows:

--in iron smelting, the production decline from May 1981 to May 1982 was 9.2 percent and 16.3 percent for 4 months;

--in the clothing industry, there was an increase of 4.9 percent and of 0.3 percent for 4 months;

--in the food industry, the production decline for May was 5.6 percent and 11.4 percent for 4 months;

--in the glass industry, there was a 1.7 percent increase in May and 4.6 percent decrease for 4 months;

--in the textile industry, the decline for May was 12.6 percent and 16.3 percent for 4 months;

--in the whiteware industry, there was an increase of 5.9 percent in May and 2.0 percent for 4 months;

--in the leather industry, there was a decline of 4.7 percent in May and of 7.0 percent for 4 months;

--in the non-ferrous industry, a decline of 2.9 percent took place in May and of 6.4 percent for 4 months;

--in the machine industry, there was a production decline in May of 1.6 percent and of 4.0 percent for 4 months;

--in the construction materials industry, the production decline from last May to this May was 7.5 percent and 11.1 percent for 4 months;

--in the metal industry, an similar [decline] of 13.4 percent took place in May, and 15.0 percent for 4 months; and

--in the precision industry, May production increased as compared to last May by 0.4 percent, but it decreased by 1.7 percent for 4 months.

The number of enterprises that reduced production as a result of shortages in material and technical supplies diminished slightly. In March 1982, for approximately 3,500 enterprises in eight basic industrial-type ministries, there were 325; in April, 348 and May, 323. Forty-four enterprises in March, 53 in April and 48 in May encountered a relatively lasting reduction in production. According to these enterprise estimates, the value of their production sales declined by approximately 20.6 billion zlotys this May (as compared to last May), which constituted approximately 4 percent of the value of socialized industrial production sales. This May as compared to this April, the above reduction in production was less 1.6 billion zlotys (7.4 percent) less).

In May, a relatively better situation in small socialized industry as compared to key industries also manifested itself more explicitly than in previous months. Production by small industry in May (as compared to last May) increased by 4.2 percent, and for the first 4 months it decreased by 0.3 percent.

Likewise, in other sections of the socialized economy (besides industry), a reduction in production in May as compared to last May was less than the 4-month period. Production by the socialized building-construction enterprises in May was less as compared to last May by 15.3 percent, and 19.6 percent for 4 months.

In May, 7,000 apartments were made available for use (approximately 31.8 percent fewer than last May). For the 4-month period, 26,900 apartments were released (34.6 percent fewer than last year).

Information on the situation with respect to capital investments is delayed by a month. It is thus known that through April investment outlays were 31 percent lower than last year, and outlays for building-construction work were lower by 26.8 percent.

Cargo transport in million tons by PKP in May (as compared to last May) increased by 1.8 percent, and declined by 4.7 percent for 4 months. As regards public and branch truck transport, analogous figures are -26 percent in May and -31.6 percent for 4 months.

We shall discuss now only the trends in agriculture. The procurement of butcher livestock in general increased in slaughter weight counted as meat per thousand tons in May as compared to April by 22.3 percent and was lower than last May's procurement by 5.4 percent (for the 4-month period there was an 11-percent reduction). Procurement of slaughter cattle was 23.7 percent higher this May as compared to last May and 1.8 percent lower for 4 months; slaughter calves, 34.9 percent higher in May and 80.5 percent for 4 months; hogs, up 5.9 percent (a 4.1 percent decline for 4 months) and poultry declined by 82.5 percent (49.1 percent for 4 months). Milk procurement in million liters declined by 3.6 percent from this May to last May, and increased by 2.1 percent for 4 months. In the case of eggs (per million), analogous figures are -11.8 percent in May and -3.5 percent for 4 months.

In May, the following was noted among the group of factors guaranteeing the development of domestic animal breeding:

- continued high prices for feeds and a further decline in pork procurement prices as compared to those of feed;
- decline of free-market prices for farm animals as compared to previous months;
- a considerable weakening in the growth rate of prices for farm animals as compared to last year;
- a further declining tendency of breeding gilts at breeding stations; and
- a further multiplying of gilt supplies to procurement points.

The supply of production means to agriculture especially feed, was a lot lower in May as compared to last year. Concentrated fodder for the period July 1981-May 1982 was delivered at a 30.5 percent lower rate as compared to an analogous period of previous years, and artificial fertilizers by 2.1 percent. There were also continuing difficulties in supplying some spare parts like tractor tires.

On the other hand, atmospheric conditions, especially in the second half of May, were favorable for the growing season. Warm and dry weather was also conducive to hay mowing. Spring grain was planted this year in an area approximately 7 percent greater than that of last year. On the contrary, there were 6 percent fewer potatoes planted by the end of May as compared to last year.

There were 7.7 million persons employed in four basic sectors of the socialized economy (industry, construction, transportation and communication and trade) or 5.3 percent fewer than last May. The personal payments fund (without workers' compensation) in four basic sectors stood at approximately 69 billion zlotys in May, which was higher by approximately 12 billion zlotys (21.1 percent) as compared to last year. Workers' compensation paid in May in these sectors (only for workers, not for family members) also stood at 12 billion zlotys. The payments fund and workers' compensation grew by 42 percent.

In these sectors, total average pay of worker compensation was approximately 10,600 zlotys, which signified an increase of approximately 3,500 zlotys, or 50.1 percent, more than last May. Without compensation, pay increased by approximately 27.9 percent. By excluding the mining industry from the four sectors (where pay without compensation stood at 19,300 zlotys in May), the average pay in May was 8,300 zlotys, and 9,800 zlotys with compensation.

We shall discuss the monetary and market situation in a later publication. It is necessary to state only that people's monetary incomes in May (as compared to last May) increased by approximately 61 percent and expenditures by 72.4 percent. The surplus of incomes over expenditures achieved only 8 billion zlotys and was 50 percent lower than in April. People's funds reached a level of approximately 1,229 billion zlotys in May. In relation to prices, then, a further decline in real income occurred.

Foreign trade turnover in May as compared to last May were higher in exports by 8.3 percent, and lower in imports by 11.5 percent. With respect to the first payments area (the socialist countries), exports increased by 14.9 percent and imports by 9.5 percent. On the other hand, as regards the second payments area (the capitalist countries), exports increased by 3 percent and imports decreased by 30.8 percent. This issue was discussed in the last issue of HANDEL ZAGRANICZNY, as well as on page 4 of this issue.

9807
CSO: 2600/717

POLAND

SPECIAL CURRENCY EXCHANGE RATES PUBLISHED

Warsaw TRYBUNA LUDU in Polish 12 Jul 82 p 7

[Text] Announcement of Exchange Rates Table No 28/82, effective 12 July 1982, by Stanislaw Nieckarz for the president, Polish National Bank, on 12 July 1982.

I. Foreign-currency exchange rates in zlotys for countries of the first payments area [socialist countries] for commercial and noncommercial payments remain unchanged.

In purchases of travelers' checks for rubles, issued by the USSR Foreign Trade Bank and payable outside the USSR in the currency of the country where cashed, an exchange rate of 11,760.16 zlotys per 100 rubles is applied.

II. Foreign-Currency Exchange Rates in Zlotys for Countries of the Second Payments Area [Capitalist Countries]

[Table on following page]

Exchange Rates Table No 28/82

<u>Country</u>	<u>Curr Symb</u>	<u>Currency</u>	Foreign Exchange				Money
			<u>Purchase</u> <u>3</u>	<u>Sales</u> <u>5</u>	<u>Purchase</u> <u>1</u>	<u>Sales</u> <u>2</u>	<u>Average</u> <u>6</u>
Saudi Arabia	771	1 rial***	25.00	25.26	--	--	25.13
Australia	781	1 Austral.dollar	87.48	88.36	86.16	89.68	87.92
Austria	786	100 schillings	492.03	496.97	484.61	504.39	494.50
Belgium	791	100 francs	181.30	183.12	178.57	185.85	182.21
Denmark	792	1 kroner	10.01	10.11	9.86	10.26	10.06
Finland	780	1 markka	18.12	18.30	17.85	18.57	18.21
France	793	1 franc	12.49	12.61	12.30	12.80	12.55
Greece	724	100 drachmas	123.31	124.55	106.88	126.41	123.93
Spain	785	100 pesetas	76.89	77.67	75.73	78.83	77.28
Holland	794	1 florin	31.34	31.66	30.87	32.13	31.50
India	543	100 rupees***	897.78	906.80	--	--	902.29
Ireland	782	1 pound***	119.25	120.45	--	--	119.85
Japan	784	100 yen	33.44	33.78	32.94	34.28	33.61
Yugoslavia	718	100 dinars	168.64	170.34	146.17	172.88	169.49
Canada	788	1 Canad.dollar	66.55	67.21	65.54	68.22	66.88
Kuwait	770	1 dinar***	298.95	301.95	--	--	300.45
Lebanon	752	1 pound	16.54	16.70	16.29	16.95	16.62
Libya	651	1 dinar***	290.47	293.39	--	--	291.93
Luxembourg	790	100 francs	181.30	183.12	178.57	185.85	182.21
Norway	796	1 kroner	13.49	13.63	13.29	13.83	13.56
Portugal	779	100 escudos	101.85	102.87	88.27	104.41	102.36
FRG	795	1 mark	34.66	35.00	34.13	35.53	34.83
United States	787	1 dollar*	86.01	86.87	84.71	88.17	86.44
Switzerland	797	1 franc	40.63	41.03	40.01	41.65	40.83
Sweden	798	1 kroner	13.99	14.13	13.78	14.34	14.06
Turkey	627	100 pounds	51.83	52.35	44.92	53.13	52.09
Great Britain	789	1 pound**	148.36	149.86	146.13	152.09	149.11
Italy	799	100 lira	6.17	6.23	5.35	6.32	6.20

*Valid also in clearing accounts with the following countries: Bangladesh, Brazil, Ecuador, Greece, Iceland, Kampuchea, Colombia, Lebanon, Pakistan, Peru and Turkey.

**Valid also in clearing accounts with the following countries: Nepal and Pakistan.

***The Polish National Bank does not purchase money in these currencies.

CSO: 2600/777

END